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## Meat Hygiene

*By*


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"Meat Hygiene" is a term introduced by Ostertag and his school in the early twenties to connote a collective applied science concerned with the production, inspection and control of meat and meat products. It deals with the condition and health of animals and carcases destined for human consumption, the construction and management of abattoirs, the preservation of meat and its processing, transport and disposal. Thus it covers a much wider field than "Meat Inspection" which had until then been all that was dealt with in this connection in veterinary colleges on the Continent.

The neglect of this aspect of the national economy in Britain in the past has been due mainly to the fact that we felt opulent enough to be able to dispense with it. Thus we could eat the best of our own production and call on the meat supplies of many other countries in Europe and elsewhere, while insisting that the quality of the imported products was up to the highest standards—which, incidentally, could only be attained by the application of the knowledge outlined above.

Another factor that has contributed to the neglect of "Meat Hygiene" in this country has been our comparative freedom from human diseases arising from that source. This was due partly to our culinary habits and partly to the fact that our livestock were more or less free from serious conditions such as trichiniasis, beef measles and the like, whilst as indicated above we could discard or refuse all but the best. As a result, though attention has been concentrated mainly on tuberculosis, food poisoning has been rare and other serious conditions practically negligible in spite of the chaotic state of both legislation and organisation.

To-day these conditions no longer prevail. The purchasing power of the pound is now drastically limited and we have many serious competitors in the scramble for a share in the world's meat. This fact, which has been repeatedly stressed by economists, is well emphasised by a recent report that the Argentine may not now be able to fulfil her limited export commitments to this country and "fall short of the contract by so much as 100,000 tons[9]."

The result is that even with the most efficient use of all that is available to us we must go short for many years to come. This has meant a great increase in "made-up" meat foods and products like potted meats, brawn, etc., with a consequent increased risk of food poisoning. At the same time, with an influx of so many people during the war years, has come an invasion of this country by such conditions as *Cysticercus bovis* infection,[5] salmonella infections,[6] etc., involving grave threats to the health of the community unless great care is taken.

To take that care and still not involve us in unnecessary waste is a vital problem for the meat industry to-day and it will only be fully dealt with if those responsible have a knowledge of comparative pathology and bacteriology, experience of laboratory methods and an understanding of the processes of production and preservation used in the meat industry. The veterinarian has always been skilled in the first of those requirements but knowledge of the latter has been limited to a very few.

While we were more or less neglecting this subject of "Meat Hygiene," veterinary coileges on the Continent and elsewhere were going ahead with its development and making it one of the main items of the veterinary curriculum. Research work, until then scattered throughout many departments, was co-ordinated and put to practical use to assist the meat hygienist and producer. The teaching programme, which up to that time dealt with meat inspection as an extramural subject only, was revised and enlarged to deal with abattoir construction, meat processing and preservation, the utilisation of by-products, the examination of food of animal origin and other items of interest to the meat trade from the hygiene viewpoint. To cope with such a wide field the number of lectures and practical classes was substantially increased and spread over the last two years of the curriculum, covering some 200 to 250 hours.

Meat inspection, which was mainly concerned with the *ante-mortem* and *post-mortem* appearance of the animal and its carcase, joined forces with meat control which covered all matters connected with the hygiene of handling, processing, transport and preservation, because it was realised that a separation of these two closely connected functions would be detrimental to the efficiency of the service and harmful to the interests of the consumer.[2] Out-of-date food legislation was amended or re-enacted, reserving exclusively for the veterinarian this item of food inspection, *viz.*, the inspection and control of meat and foods of animal origin, for which he had been prepared by his course of study.[8]

Such is the picture of the development of "Meat Hygiene" on the Continent before the second world war and judging from both literature and legislation, a similar development occurred in the U.S.A. "By keeping the inspection of meats . . . in the hands of veterinarians, the United States has undoubtedly the finest and safest meat supply in the world."[1] It is no wonder, therefore, that Thornton[11] states "Britain compares very unfavourably with Continental and other countries in the scientific approach to the problems of meat hygiene, inspection and control."

During the last 50 years the demand for meat has shown a steady rise and no great fluctuations have been experienced. At present, on the contrary, meat is a commodity of which there is a great scarcity and there is little hope of improvement in the near future as demand far exceeds productive possibilities. As was stated by the Minister of Food in Parliament recently, "Even if we had all the dollars and other scarce currencies we wished, we should still be unable appreciably to increase the present meat importation. The meat is not in the world to buy . . . The future prospects for bacon are little if at all better than those of meat."[10] This is due to a combination of factors, the most important being probably the gradual rise in the standard of living in many countries, as such a rise is always accompanied by an increase in the consumption of protein-rich foods. The devastation of the war years and the steady increase in the world's population have, of course, added to the difficulties of the position.

To cope with this rising demand new supply centres will have to be organised as those in existence are inadequate and not always satisfactory from the economic aspect. Since the beginning of the last war, Canada has begun to develop her bacon industry and Australia and South Africa, the production of beef and mutton. Since the end of the war, the necessity of dollar saving has led to more and more attention being given to the development of the African Colonial Empire as one of Britain's meat stores of the near future.

In the development of these new supply bases much will depend upon the part which the veterinary profession is allowed to play, for experience in other countries has shown that without the assistance of the veterinarian, meat production cannot develop to its fullest efficiency.[7]

For this nation to establish itself on the food market, it is not sufficient to mark the product with an indication that it has come from the Commonwealth or Colonies. For sentimental reasons, the purchaser might no doubt prefer to buy these foods but in actual practice he will tend to buy whatever is most pleasant to his taste within the limit of his means. In the food market sentiment has little or no importance. To compete with other producers and secure a lasting foothold, it is necessary to ensure the standard production of articles which will satisfy the consumer's palate, habits and purse. To achieve the quality of Argentina's beef or the flavour of Denmark's bacon at an economic level, improvement is necessary in methods of production, processing, preservation and transport. Work on these subjects may easily fail to meet the needs and difficulties of the meat producer if done without an intimate knowledge of his daily routine. What is required is co-ordination between the breeder, meat producer, meat industrialist and meat research centre. The person most fully trained to bring this about is the veterinary surgeon with his fundamental knowledge of breeding, feeding and ailments of livestock, of meat hygiene, production and preservation. Unless use is made of his knowledge in this vital drive for meat supply, the new centres must

undoubtedly remain behind those meat-producing countries which have already appreciated the necessity of veterinary supervision.

The abattoir, the centre of meat production, has to be built and equipped to guarantee smooth running and a high degree of hygiene to prevent *post-mortem* infections and thus improve the keeping quality and the wholesomeness of the meat. The factory type represented by the packing plants of the U.S.A. or frigorificos of the Argentine will find ample use where meat production is carried out on an export scale. The smaller type of central abattoir represented to a certain extent in the "German type," providing all essential facilities required for the supply of a smaller area, would be the appropriate standard for this country. In both, adequate provision should be made for cold storage facilities, by-product plants and laboratory work. The latter is vital for the purposes both of diagnosis and investigation and, therefore, at one and the same time protects the consumer's health, avoids unnecessary condemnation and assists the nation's economy.

To run an abattoir so as to satisfy the demands of both hygiene and economy, the person in charge must have an intimate knowledge of "Meat Hygiene" besides being well acquainted with the requirements of the trade. "While an inspector might soon be trained to detect any departure from the normal when examining meat . . . the identification of the various diseases encountered and any decision regarding the action that should be taken, requires more than a superficial knowledge of comparative pathology and related subjects, in addition to clinical experience, skill in laboratory technique, and the ability to interpret and apply laboratory reports. No meat inspection service could be said to be adequate unless it was under the supervision of officers with that special training and experience. It was assumed, of course, that an officer engaged in meat inspection would make himself conversant with the meat industry and trade practices."[5] Little can be added to this statement of the demands of a satisfactory meat inspection service, which can only be carried out if "placed under veterinary supervision."[4]

It is, therefore, interesting to note a recent advertisement (July 14th, 1948) from South Africa, as indicating the attitude towards the problem of meat inspection in a dominion where the meat industry has begun to develop. According to this advertisement a veterinary surgeon is required for the post of the Director of the Municipal Abattoir of Durban. His duties will comprise "complete supervision of operations and management, meat inspection and the legal implications, administration of a large cold storage system and a by-product plant . . . salary per annum £1,750."

This is not an isolated instance and there are already indications that these countries are looking to us to help them train the necessary personnel. It is, therefore, essential for our veterinary colleges to reconsider their position in this matter and to expand and develop their courses to meet the new situation so that the profession may be enabled to play its full part in the "production drive" so vital to our survival.

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## AGENE IN FLOUR

Prior to the Christmas Recess, Mr. J. A. Boyd-Carpenter asked the Minister of Food whether nitrogen trichloride was still being used in the manufacture of wheat flour.—Mr. John Strachey replied: Yes, Sir. A scientific committee including Sir Edward Mellanby and Sir Wilson Jameson are reviewing its use and I shall of course be guided by their conclusions. Mr. Boyd-Carpenter: Can the Minister say how long the deliberations of this committee have taken? Is he aware that there is increasing evidence from America of the dangerous nature of this drug?—Mr. Strachey: I cannot give the date when this committee will be in a position to report. As I understand it, the most recent work on this question was done by Sir Edward Mellanby in this country.

## The Inferior Buccal Gland in the Camel


*By*

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### Introduction

Although the economic importance of the camel as a transport animal has been accepted since the earliest days of civilisation, little has been written on its anatomy.

Such studies should be investigated on a comparative basis and related to the habitat of the animal. The desert life of the camel, which allows access only to foods of a coarse nature, suggests the digestive system as a profitable source of investigation, and attention was directed in the first place to the nature of the buccal mucosa.

The mucosa of the cheeks are covered with long strong papillae surmounting the strong widely tabled molar teeth. Lesbre (1903) states that the cheeks of the camel are studded with long powerful teeth-like papillae directed caudally, each measuring from 2 to 2½ cm. in length. He also reports the majority of these papillae as divided at their summits into smaller divisions while others are simple and lie side by side. Rabagliati (1924) states that the mucous membrane lining the cheeks is very rich in papillae which are either partly or wholly pigmented and are directed posteriorly (caudally). The buccal glands are situated deep to the papillae. According to Leese (1927) the molar (buccal) glands in the camel are well developed and minute salivary glands are placed at the base of the papillae studding the cheeks. The secretion from the buccal glands assists in the formation of the bolus and is, therefore, of particular interest in this species in view of the nature of the food. Three groups of buccal glands are present in the camel, as in other domestic animals, of which the inferior group is the most important.

In regard to the nature of the inferior glands in other species, Chauveau (1891) states that in the horse the inferior buccal gland is less lobulated and voluminous, and not so wide as the superior. It is placed along the inferior border of the buccinator muscle immediately beneath the mucous membrane of the mouth near the area where the membrane is reflected from the side of the cheek on to the inferior maxilla. It is bordered for the whole of its extent by the buccal nerve. Chauveau concludes by saying that the gland pours its secretion into the mouth by numerous salient orifices, which are arranged in line on the buccal membrane, parallel to each molar arch. Sisson (1938) records that the inferior buccal glands of the horse are less voluminous than the superior and that they are situated in the submucous tissue at the lower border of the buccinator muscle. He refers to a linear series of small papillae as indicating the orifices of the small ducts of the buccal glands.

M'Fadyean (1922) mentions three papillae and ducts and classifies the gland as a string of lobules included between the mucous membrane and the buccinator muscle. Bradley (1923) indicates that the ventral (inferior) buccal glands stretch from the margin of the masseter to the level of the angle of the mouth and Strangeways (1917) draws attention to the numerous orifices along the lower border of the buccinator by means of which the glands discharge their contents into the mouth. According to Chauveau, the glands are better developed in the ruminant than in the soliped and Sisson supports this with the statement that in the ox they consist of a compact brownish mass reaching from the angle of the mouth to a short distance under the masseter muscle. The same author mentions the compact nature of the glands in the pig and that they form a series with the inferior labial salivary glands in the dog, although he does not elaborate this latter statement.

### Material and Methods

In 20 camels slaughtered in Belbeis and Cairo abattoirs the buccal cavity was subjected to detailed dissection and the relations of the buccal glands were carefully noted. Weights and measurements of the glands were then recorded and most of the glands were examined in the fresh state. A percentage were preserved in 10 per cent. formalin solution for further investigations.

### Observations

*Macroscopical Examination.*—The inferior buccal gland is situated on the outer surface of the horizontal ramus of the mandible, extending the distance from canine to last lower molar tooth. (See Fig. 1.)

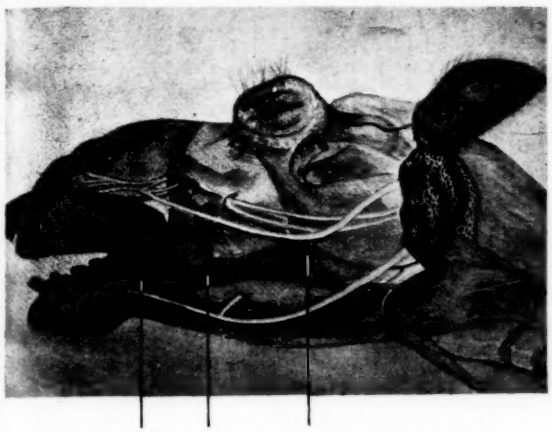

Fig. 1.—The Inferior Buccal Gland in the Camel

The gland is roughly triangular in shape and is composed of a single compact mass of dark brown colour. The base is applied to the anterior border of the masseter muscle. The superior (upper) border is irregular in outline in relation to the inferior labial vessels and the buccinator nerve. The inferior (lower) border is almost straight and in close relation with the inferior buccal branch of the fascial nerve and the labial vein.

In the living animal the inferior border of the gland may be felt at a distance of about 1½ inches from the free border of the horizontal ramus of the mandible. The ducts open on a series of fine papillae running parallel to and in contact with the lower cheek teeth.

*Microscopical Examination.*—Section reveals the inferior buccal gland of the camel to be similar in general structure to that of other domestic animals. The alveoli of the lobules, however, are much smaller in size (see Fig. 2), the inter-lobular connective tissue is much thicker and is supported by elastic fibres (see Fig. 3) which assist in the attachment to one another of the discrete lobules.

## Conclusions

The inferior buccal gland of the camel differs in both position and structure from that in other domesticated animals. It is situated at a lower level on the horizontal ramus of the mandible. Individual lobules are large and are separated by layers of connective tissue interspersed with elastic fibres, this provision being instrumental in binding the lobules closely without destroying their individual appearance. The small size of the alveoli is another distinctive feature. The greatest similarity is with that of the ox.

*Acknowledgments.*—The writer acknowledges gratefully the help given by Dr. N. Goergi, the head of the department of anatomy, and Dr. A. H. Mahmoud, M.V.SC., M.R.C.V.S., in preparing and writing this paper.

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### Weekly Wisdom

" . . . *He who stolidly passes by men and their fates, he whom the staggering does not stagger nor the inspiring inspire, for him life is in vain, he has no part in it.* . . ."—Hartmann's Ethics, **1.** 35.

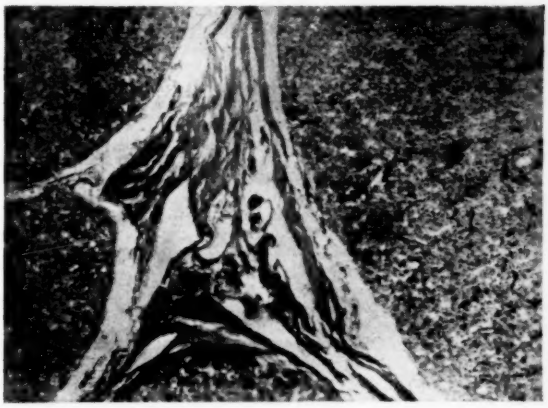

Fig. 2.—Section showing small size of Lobular Alveoli and Thick Inter-lobular Connective Tissue

Fig. 3.—Section showing large amount of Inter-lobular Connective Tissue with Elastic Fibres

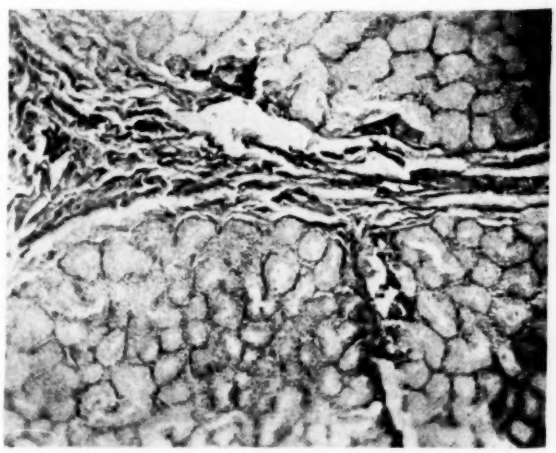

Fig. 4.—Section of Typical (Domestic Animal) Inferior Buccal Glands.

Note.—Large alveoli of lobules and small amount of inter lobular connective tissue

## CLINICAL COMMUNICATION

### Cases of Foul in the Foot in very Young Calves

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*Subjects.*—Two heifer calves belonging to a herd of attested Ayrshires, well managed, and kept in hygienic surroundings.

*History and Course.*—On November 8th, I was called to see a calf which had been born on October 5th. It had been lame for two days and exhibited in both the left fore and the right hind feet lesions identical with those seen in foul of the foot in adult cattle, *i.e.*, the skin between the digits had been tense and painful, then it cracked and a cheesy pus exuded. The calf was perfectly normal otherwise, and feeding well.

Treatment consisted in applying propamidine jelly (M. & B.) locally after removing as much pus as possible, and giving an initial loading dose of 20 c.c. soluseptasine subcutaneously, followed by 12 grammes sulphapyridine orally twice daily for four days. On November 12th, the farm was revisited and the above calf found to be greatly improved.

A second case had now arisen in a calf born on October 24th (*i.e.*, 19 days old). It was affected in exactly the same way in both the left fore and the left hind feet, and was given the same treatment as the first except that it received only 6 grammes sulphapyridine orally twice daily. A sample of pus was taken and on staining by Gram's method revealed numerous Gram-negative rods resembling *F. necrophorus*. There were also present a large number of small Gram-positive rods and a few chains of streptococci.

By November 19th, the first calf had completely recovered and the second was much better. By the 24th it, too, was back to normal.

#### SUMMARY AND COMMENTS

Cases of apparently typical foul in the foot are reported in two calves aged 34 days and 19 days, respectively. Both responded promptly to treatment. Both calves had clean dry navels, and normal appetites, and there was no sign on the premises of calf diphtheria (also said to be due to *F. necrophorus*).

It may be mentioned that earlier in the summer a case of "fouls" in an adult cow on the same farm was successfully treated with two intravenous injections of sulphapyridine soluble (an interval of five days between).

No reference can be found in the literature to the disease occurring in animals as young as this, and it is felt that the cases are worth recording.

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### EQUESTRIANISM: PREPARATION FOR NEXT OLYMPIC GAMES

A Special Correspondent of *The Times* reports that good progress has been made in the lay-out and construction of the courses for the Badminton three days event which will be held at Badminton in April, and continues: "This is a progressive event, organised with a view to entering a team for the next series of Olympic Games in as high a state of training and ability as possible. In view of the most creditable performances of both our teams at Wembley and Aldershot, in spite of only a short preparation, this is clearly desirable.

"In addition to the substantial prize money already announced, an American sportsman has offered a challenge trophy in the shape of a silver-mounted elephant's tusk for annual competition in this event. The pair to it he has already offered to the American organisation which is arranging a similar event in the United States. The American team which covered itself with glory at Aldershot has now been dispersed, but this event will serve to produce another team in 1952 which is unlikely to be much inferior.

"It is conceivable that this gift will be the means of future equestrian competitions between America and this country, which would be of considerable interest. Entries for the Badminton test are said to be satisfactory. It would be a thousand pities if owners were deterred from entering promising horses on the ground of inexperience in *dressage*, since the competition is designedly progressive to accommodate inexperienced entries. No saddle horse can fail to benefit from the training involved for the *dressage* section, and there is no excessive strain on a fit horse involved in the cross-country section."

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The U.S. Public Health Service reports that there were 12 milk-borne outbreaks of disease in 1946. Of these, eleven originated from raw milk and one from pasteurised milk which was accidentally contaminated with a poisonous chemical. In six additional outbreaks milk was suspected.

## ABSTRACTS

**[I.—Endocrine Control of the Mammary Gland. (A) Mammary Development, (B) Lactation. II.—The Nervous System and Lactation.** FOLLEY, S. J. (1947.) *Brit. med. Bull.* **5.** 130-148.]

I (A). It has long been known that mammary development is under the control of hormonal rather than nervous stimuli, but in studying the factors responsible insufficient attention has often been paid to the necessity of distinguishing between the growth-phase, which appears to be largely confined to the first half of pregnancy, and the secretory phase beginning about mid-pregnancy, which is accompanied by an increase in size of the gland due mainly to accumulation of secretion in the glandular tissues.

The first paper gives a brief review of published work on certain aspects of mammary growth. The author concludes that the ovarian hormones, oestradiol and progesterone, are the chief primary agents responsible for evoking mammary growth. In most, perhaps all, species, both oestrogen and progesterone are necessary for complete and normal mammary gland development. In certain species, particularly ruminants, oestrogen alone evokes development of a considerable amount of alveolar tissue, though this is not necessarily normal in either structure or amount.

It is also established that the anterior lobe of the pituitary gland may secrete substances which can cause mammary development, but the author holds that the theory of Turner and his co-workers that oestrogen and progesterone act through the agency of specific anterior pituitary "mammogens" has still conclusively to be proved and that the case for the direct action of ovarian hormones on the mammary tissues has yet to be overturned. It may well be, however, that pituitary influence is essential for the complete expression of the mammary-growth-stimulating action of ovarian hormones. The influence of thyroid hormones on mammary development is thought to be indirect, probably by modification of the response of mammary tissue to the stimulating hormones. The influence of the placenta on true mammary growth is still problematical though there is evidence to suggest that in the absence of the pituitary gland the placenta may assume a hypophyseal function in secreting a hormone or hormones capable of initiating the secretory phase and thus preventing mammary regression.

(B). For more than 20 years it has been known that, provided a sufficient amount of responsive mammary tissue were present, lactation could be started (lactogenesis) by anterior pituitary extracts, whilst both this and the maintenance of lactation (galactopoiesis) are impossible in the absence of the pituitary gland. It was fairly soon realised that the lactogenic properties of anterior-pituitary extracts were not associated with the growth hormone, or the thyrotropic and gonadotrophic hormones and a specific lactogenic hormone (prolactin) was postulated and later identified and assayed on the basis of the pigeon "crop gland" test. This hormone, which has now been purified, is held by many to be the specific hormone responsible for the initiation of lactation though that may not be its only function. There is evidence, however, that in some species partly purified prolactin will not by itself initiate lactation in hypophysectomised animals, though it will do so in combination with adrenal cortex extracts. Thus, in place of the conventional single hormone theory, the author of this review has put forward the conception of a lactogenic-hormone complex of which at least prolactin and adrenotrophin are members. There is as yet, however, no conclusive evidence of the existence of a specific lactation hormone of the adrenal cortex (cortilactin). There is evidence to suggest that the release of lactogenic hormones from the pituitary may to some extent depend on nervous stimuli. Investigations on lactating ruminants have shown that anterior pituitary extracts also exert a marked but temporary galactopoietic effect in which again more than one hormone would appear to be involved.

So far as oestrogens are concerned, while large doses tend to suppress lactation, in smaller doses they may function both as lactogenic and galactopoietic agents. This has been strikingly demonstrated on ruminants where oestrogen will not only evoke udder growth and the initiation of copious lactation but also an increase in milk yield and in the concentration of milk solids due to an increased secretion of major milk constituents. These effects are probably caused via the pituitary which is supposed to release the lactogenic and galactopoietic hormone complexes in response to the stimulus of oestrogen or of its metabolic derivatives.

Studies of the effect of administration of thyroid hormone on milk yield support the view that the intensity of lactation is to some extent dependent on the general level of activity of the thyroid gland. It is now known that thyroxine treatment will temporarily raise the lactation curve to a higher level and produce an increase in milk solids. Essentially similar results have been obtained by oral administration to lactating cows of iodocasein, a protein derivative which exhibits thyroidal activity.

Posterior pituitary extracts have been known for nearly 40 years to cause a marked increase in pressure of the milk in the gland cistern with which is associated an increased ease of abstraction of the milk. It is known that such extracts have no direct effect on milk secretion but exert their influence through the mechanism governing the discharge of milk from the mammary gland, causing apparently some contraction of mammary tissues (though the exact nature of the cells concerned is not yet clear) and thus squeezing the milk from the alveoli and smaller ducts down into the large ducts and milk cisterns. Such increase in actual milk secretion as has been reported occasionally, especially with cows in declining lactation, is ascribed to the beneficial effects on the function of the secretory cells of more efficient removal of milk from the alveoli. No direct evidence of the role of posterior pituitary in the normal physiology of suckling or of milking has yet been forthcoming (see II).

So far as the initiation of lactation is concerned, it is known that though secretion commences about mid-way through pregnancy, copious lactation does not begin usually until shortly after parturition. The mechanism governing this has been the subject of much speculation and the theory for which there is most support holds that oestrogen, probably of placental origin, keeps the secretion in check during pregnancy by inhibiting the secretion of prolactin and possibly also by a direct influence on the mammary gland. The fall in level of blood oestrogen at parturition then permits the release of prolactin by the hypophysis and hence the initiation of full lactation. On the other hand, in view of the phenomenon of oestrogen-induced lactation we must assume that relatively low levels of circulating oestrogen are capable of evoking the secretion by the hypophysis of the lactogenic and galactopoietic hormone complexes. It is suggested by the author of this article, therefore, that during pregnancy oestrogen levels are high enough to inhibit partially hormone secretion by the anterior lobe and that at parturition the oestrogen level falls through the region between the thresholds for pituitary inhibition and stimulation, thus causing release of sufficient of the relevant hormone complexes to bring the mammae into full function.

### The Nervous System and Lactation

II. While hormonal factors are of paramount importance in lactation, as shown by many transplantation experiments, modern work reviewed in this article is tending to show that the nervous system does participate in the control of lactation and that there is an interplay between neural and hormonal mechanisms.

There are various ways in which the nervous system might affect lactation. Obviously it could affect the supply of milk precursors by controlling the blood flow through the mammary gland, but little is known about that aspect. The rate of secretion of hormones concerned in initiation and maintenance of milk-secretion may be to some extent under nervous control, *e.g.*, the secretion of prolactin may be stimulated by a nervous reflex in response to mechanical stimulation of the nipple as, for example, in suckling. There would seem to be considerable circumstantial evidence in favour of this, but the neural pathways involved have not been completely worked out. The removal of the suckling stimulus is an important factor in bringing about mammary involution after weaning although the effects of non-removal of milk may also make some contribution. Some additional cause must be postulated to account for the gradual involution which occurs in the mammary glands of milk-producing ruminants in spite of regular application of the milking stimulus and withdrawal of milk.

The process of obtaining the full yield of preformed milk from the mammary gland by suckling or milking involves not only physical but also physiological and psychological factors. The application of the suckling or milking stimulus to the teats is normally followed after a brief interval by a sudden rise of pressure within the udder, a phenomenon which is called "letting down" of milk and which is of considerable importance for satisfactory and continued lactation. A large amount of research in recent years has resulted in the suggestion that stimulation of the teat or some conditioned stimulus causes a reflex secretion of oxytocin by the posterior pituitary which in turn provokes contraction of smooth muscle tissue in the mammary gland. Posterior pituitary extracts can undoubtedly evoke in the mammary gland a condition resembling "let-down," but convincing evidence that it is actually oxytocin which mediates the normal process during milking has yet to be published. Moreover, no satisfactory evidence has been brought forward of the existence of smooth muscle fibres which could cause constriction of alveoli. The process is, however, of undoubted practical importance and further investigation would seem to be desirable.

A. R.

## REVIEW

**[The Feeding of Farm Livestock.** By J. C. B. Ellis, M.A. Pages viii+271; 26 photographic illustrations. Second edition, 1947, price 18s. London: Crosby Lockwood & Son, Ltd. (Agricultural and Horticultural Series.)]

The second edition of this text-book by the Lecturer in Animal Nutrition in the Department of Agriculture at Oxford does not differ materially in lay-out from the first, published in 1937, and the author has deliberately concentrated upon standards of feeding attainable in more "normal" times, to the exclusion of substitute practices developed during the war years. The whole text remains highly conventional, although two modifications of some importance have been made, *viz.*, acceptance of the net energy requirement as being proportional to the three-fourths rather than to the two-thirds power of the live weight, and the use of percentage digestible protein content, rather than protein equivalent, as an index of the value of individual foodstuffs.

This is a very readable little work, and the illustrations are excellent. In scope it corresponds to the substance of a good deal of the relevant course given to veterinary students in the early 1930's, and it is probable that it will provide useful introductory reading to present-day students about to embark on the Animal Husbandry Part II syllabus. Beyond the conventional, however, it does not go far. Modern nutritional researches on vitamins and minerals are hardly touched upon, and it is unlikely that the scanty information provided on these and related topics will be deemed adequate even for agricultural students. It seems unfortunate that Maynard's excellent text-book—intended, of course, for much more advanced students, but a well-documented digest of both classical and modern studies on animal nutrition—does not appear among the list of works consulted by the author. As it is, there is little to form a link between the old and the new concepts of livestock nutrition.

There is a misprint, vitamin F (for vitamin E) on page 12, but in view of the paucity of information given this hardly matters.

The adverse criticism above must be held to relate only to the scope of the text. So far as it goes, the subject matter is well presented, and many practitioners would find in it an easily assimilable refresher course in the standard methods of rationing.

## SYNTHETIC INSECTICIDES

Information on synthetic insecticides is contained in B.I.O.S. Report, No. 1808, Item No. 22 (Stationery Office, 4s. 6d.). The substances dealt with (states *The Pharmaceutical Journal*) include Bladan (H.E.T.P.), T.E.P.P., E.605 (dicthyl-*p*-nitrophenylthiophosphate), dialkylfluorphosphonates, and their related compounds. The report gives details of the method of preparation of various synthetic substances, their chemical structure and toxicity. Reference is also made to two substitutes for DDT, known as M.1700 and Lucex.

Work on Bladan has now ceased in favour of E.605, because of German shortages of phosphorus. It has been shown that its effect is due to one of its products of hydrolysis, namely, tetra-ethyl-pyro-phosphate (T.E.P.P.), T.E.P.P. is not considered safe for use as an insecticide, as its toxicity to man is too high. Its insecticidal activity and that of related compounds have been studied in relation to chemical structure. The insecticidal activity of E.605 is greater than that of DDT. It is expected that it will replace the latter for field application, but not for domestic pests, because of its odour and its toxicity to warm-blooded animals; it is too toxic for veterinary application. It is more economical in use than either sodium arsenate or DDT, has no serious hazards, but oil solutions should be washed off the skin immediately because of its greater absorption.

The following formulae are put forward:—

(1) A dust containing 2 per cent. crude E.605 and 98 per cent. talc.

(2) A "miscible" oil concentrate containing 70 per cent. crude E.605 and 30 per cent. emulsifier.

(3) A more dilute miscible oil containing 7 per cent. crude E.605, 3 per cent. emulsifier and 90 per cent. water.

The general concentration used in dilutions for spraying is 1 of crude E.605 in 10,000.

* * * * *

An international congress of biochemistry is to be held at Cambridge from August 19th to 25th, 1949. There will be eleven sections, with visits to research stations and laboratories. The congress is being organised by the Biochemical Society; details can be obtained from the Hon. Organiser, 1st International Congress of Biochemistry, 56, Victoria Street, London, S.W.1.

## Questions and Answers

The submission of questions for inclusion in this column will be welcomed: they can relate to any aspect of veterinary work. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

### Pneumonia in the Bovine

**Q. CCLXXVII.**—*During the last four or five weeks I have been meeting quite a few cases of pneumonia in the bovine—chiefly milk cows. These cases crop up sporadically in the herds with usual symptoms of cessation of milking, lost appetite and rumination, distressed breathing with some coughing and grunting; temperature 104 to 106° F. On chest auscultation abnormal lung sounds are evident.*

*While I have treated these animals with sulphanilamide and some cases with penicillin and* Corynebacterium pyogenes *toxoid, I consider the two former to be of little value in bovine pneumonia, as I believe* Corynebacterium pyogenes *to be the invading organism in these cases. I will be delighted to have suggestions for treatment of such cases.*

**A.**—The majority of the causal organisms of bovine pneumonia are penicillin-susceptible, but it must be emphasised that the minimum dosage required to maintain a satisfactory concentration in the serum is still not established, and until further evidence on this point is available it is absolutely essential that a very heavy and frequently repeated dosage must be used, *viz.*, 2,000,000 units during 24 hours, divided into six four-hourly doses. It will be evident that this procedure is rarely practicable, as it must be continued for 24 hours after the temperature becomes normal.

The questioner mentions that these cases have occurred during the last four or five weeks (*i.e.*, during the late summer of 1948). In the experience of the respondent, there has been this year (1948) a unique number of cases of parasitic bronchitis and pneumonia in milch cows, and it would seem possible that the questioner's cases may be in this category. The sulphonamides are, of course, of little or no value in infections secondary to parasitic infestation, but housing day and night and the adoption of the usual nursing measures generally results in some improvement.

* * * * *

### Inoculation Against Rinderpest

**Q. CCLXXVIII.**—*The present method of preventing rinderpest in a herd of over 1,000 dairy cattle, of Ayrshire, Friesian, Jersey and Guernsey breed in Hong Kong is the biannual inoculation of 50 c.c. of formolised spleen pulp vaccine, prepared by the Pasteur Institute in Indo-China.*

*Experience over a period of several years has proved that this is a thoroughly efficacious method of preventing rinderpest in this herd in this Colony where rinderpest is endemic.*

*As the method, however, is cumbersome and expensive, answers to the following questions would be much appreciated:—*

1. *Would the inoculation of virulent blood—caprine or bovine—some time after the use of the vaccine mentioned prolong immunity, making it unnecessary, as at present, to inoculate this vaccine biannually?*
2. *If so, when is the optimum time to inoculate such blood?*
3. *Would the adoption of this procedure entail any risk?*

(Note.—*It should be mentioned that the idea of adopting any method which involves any risk whatsoever cannot be entertained. For this reason the use of attenuated goat virus, with or without serum, in pregnant cows newly imported from Canada or Australia cannot be considered.*)

4. *Is avianised vaccine now used in any part of the Empire, and if so, with what success?*
5. *Is there any improvement, not outlined above, on the method now in use?*

**A.**—1 and 2. Inoculation of goat virus after the use of tissue vaccine for the immunisation of dairy cattle of European breeds was tried out in Kenya, but was given up as unsatisfactory. It was apparently difficult to judge the optimum interval between the two inoculations. If the goat virus was given too soon severe reactions would occur; if too late, reaction was blocked out and no prolongation of immunity was obtained.

In this connection the paper by Mitchell & le Roux in the *Onderstepoort J. vet. Sci.* **21.** 7-16, is of interest. They concluded that the optimum interval was seven days. It should be remembered, however, that the tissue vaccine they used was made from the spleens of cattle which were reacting to *goat* virus.

3. An element of risk in such a method would arise should there be any doubt about the potency of the tissue vaccine which had been used.

4. The American strain of avianised virus was sent to Kabete, Egypt, Onderstepoort and to Nanking. The respondent is not certain whether it has been maintained at any of these places. Enquiry should be made from Dr. E. G. White, Director of the East African Veterinary Research Organisation, Veterinary Research Laboratory, Kabete, Kenya, or from Dr. R. A. Alexander, Onderstepoort Laboratory, S. Africa.

It does not seem to have come into use in any part of the Empire although field trials were made in Kenya. It was, it is understood, used on a fairly large scale at Nanking.

5. Japanese workers have been using a rabbit-adapted or lapinised virus for some years and claim very good results. This Japanese lapinised virus has been sent to Kabete, where it is being studied. The respondent understands that it may possibly prove to be a suitable agent for immunising highly susceptible breeds of cattle. Dr. White would be able to give more definite information.

* * * * *

### Is There a Mare-Gelding Reaction?

**Q. CCLXXIX.**—*If brought into contact with him, does a mare in season in any way affect the behaviour of a gelding? If the answer is in the affirmative, how may this be shown—gelding being understood not to refer to a "rig" or to any imperfectly castrated horse.*

**A.**—Most geldings exhibit male sexual behaviour towards a mare in season for a period after castration, the period varying according to the individual animal, his condition and the age at which he was gelded. A yearling in poor condition might not show any interest whatever; a two-year-old usually loses all ambition after being kicked by the mare a few times; while the period in an animal of four years old or older and in good condition might extend for several months.

If, after a reasonable period has elapsed, the gelding still reacts to the stimulus of a mare in season it may be assumed that the animal has not been perfectly castrated and it would be justifiable to attempt to correct the condition by operating to remove the stumps of both umbilical cords together with any portion of epididymis that may have been retained.

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### Injection for Pregnant Bitches

**Q. CCLXXX.**—*Which is to be preferred as an injection for bitches whose litters die about the third day—B.H.S. vaccine or penicillin? At what stage of pregnancy should they be used and in what dosage?*

**A.**—The writer is assuming that it has been ascertained that the organs of the pups which are fading out are positive for streptococcal infection and that other possible causes have been eliminated.

Vaccination with a beta haemolytic streptococcal vaccine, preferably autogenous, is usually carried out between pregnancies. Dosage will depend on the concentration of the vaccine and will be advised by the pathologist preparing it. It is usually graduated and given at three- to seven-day intervals.

While nothing is known of the value of penicillin therapy in the pregnant bitch, it seems very unlikely that it will sterilise a local surface infection in the vagina or have any influence on post-natal infection of puppies from maternal discharge. There are, however, records of its use in litters where the pups start dying off.

When symptoms of crying and inability to suckle have been seen in time one or two intramuscular injections of penicillin 10,000 I.U. have caused spectacular recovery in apparently dying pups, and similar doses given to the remainder of the litter have on many occasions apparently prevented further deaths.

This line of treatment would certainly seem worthy of further trial.

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### Correspondence

#### *The Treatment of "Wens"*

Sir,—The injection into the lesion of an aqueous solution of penicillin Na salt is the most effective treatment described in "Questions and Answers." A dose of 0·1 to 0·2 mega units is employed, and precautions to be observed are to use an all metal syringe with a fairly thick needle, and preferably to cast the animal before commencing to give the injection, which is given in about 20 c.c. of water at four or five different sites.

Yours faithfully,

96, Castle Street, Bolton. J. Adamson.
*December 20th, 1948.*

# NOTES AND NEWS

### Diary of Events

Jan. 10th to 13th, 1949.—R.C.V.S. Council and Committees, 10, Red Lion Square, London, W.C.1.
Jan. 12th.—Meeting of Editorial Executive Sub-committee, 36, Gordon Square, W.C.1, 2.30 p.m.
Jan. 14th.—V.V.B.F. Ladies' Guild Dance, at Dumfries (Cairndale Hotel).
Jan. 19th.—Meeting of the West of Scotland Division, N.V.M.A., at Glasgow (Central Station Hotel), 2.30 p.m.
Jan. 21st.—Annual Meeting of the Mid-West Division, N.V.M.A., at Bristol (Berkelev Café, Clifton), 2 p.m.
Jan. 21st.—157th Annual Ball of R.V.C., at Grosvenor House,
Jan. 21st.—Meeting of the Midland Counties Division, N.V.M.A., at Birmingham (Grand Hotel), 2.30 p.m.
Jan. 21st.—Meeting of the Lincolnshire and District Division, N.V.M.A., at Grantham (George Hotel), 2.15 p.m.
Jan. 25th.—Meeting of the Derbyshire Division, N.V.M.A., at Sutton Bonington (Midland Agricultural College), 2.15 p.m.
Jan. 28th.—Annual Meeting of the Yorkshire Division, N.V.M.A., at Leeds (Hotel Metropole), 2.30 p.m.
**Aug. 8th to 13th.—Fourteenth International Veterinary Congress, Central Hall, Westminster, and Church House, Westminster, London, S.W.1.**

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PERSONAL

## The New Year Honours

### Capt. Vincent Boyle receives the C.M.G.

### Sir John Boyd Orr, Hon. Associate N.V.M.A., a Baron

The New Year honours list published on Saturday last intimates the bestowal of a number of awards which will be welcomed warmly by members of the veterinary profession.

The high distinction of Companion of the Order of St. Michael and St. George is conferred upon Capt. Vincent Boyle, Superintending Inspector, Animal Health Division of the Ministry of Agriculture and Fisheries.

Capt. Boyle entered the service of the Ministry of Agriculture, as a member of the inspectorate staff, in August, 1913, and on the outbreak of the first world war he served with the R.A.V.C. until 1918, when he resumed duty with the Ministry.

In October, 1936, he went out to the Argentine as the Ministry's representative primarily with the object of ensuring that disease was not introduced into this country with imported meat. That visit lasted for 12 months, when he returned to London, being promoted Superintending Inspector on January 1st, 1938. From that time until July, 1942, he remained at head office, and in that month he was transferred to Carmarthen as the Superintending Inspector in charge of that area.

In March, 1943, Capt. Boyle returned to the Argentine where he has worked ever since, with the exception of one short break for leave, as the Ministry's representative on special duty.

An outstanding feature of the list is the honour accorded Sir John Boyd Orr, who is created a Baron. Some may recall that at a special meeting Council, N.V.M.A., in October, 1924, Professor Wooldridge called attention to an omission made at the Aberdeen Congress the previous year, in a failure officially to honour "members of other professions who have brought excellent papers before us." He thereupon proposed "that honorary membership of the N.V.M.A. be conferred upon Dr. Crew and Dr. Orr." "Dr. Orr" has attained the heights of international fame as a nutritionist since those far off days, and recently retired from the post of Director-General of the Food and Agriculture Organisation of the League of Nations. Sir John has kept in close touch with the profession, and his inability to give the Public Lecture at Southport was a source of deep regret to all of us.

Another award upon which the profession will wish most heartily to congratulate the recipient is the knighthood conferred upon Mr. James Turner, the energetic leader and popular President of the National Farmers' Union. A great agricultural ally of the profession, Mr. Turner has indeed earned the notable recognition now accorded him for his unremitting labours on behalf of the great industry and organisation he serves so well. The award of the C.B.E. to Dr. John Hammond, of Cambridge, also will be widely welcomed as a tribute to the eminence of a great agricultural scientist.

Other honours calling for special note in our columns are those conferred upon Lord Hailey, Chairman of the Colonial Research Committee, who becomes a Companion of Honour, for his distinguished services to the Colonial Empire; Dr. William G. Ogg, the soil scientist, Director of Rothamsted Experimental Station, now a Knight Bachelor, and Sir William Jameson, Chief Medical Officer of the Ministry of Health and the Ministry of Education, who receives the G.B.E.

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*Birth.*—Crawshaw. On January 1st, 1949, to Eileen, S.R.N. (*née* Smith) and H. A. Crawshaw, F.R.C.V.S., at the Jarvis Maternity Home, Guildford, a daughter, Pamela Mary.

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*Marriage.*—Burns—MacGregor.—At Kilmore Parish Church, Oban, on November 20th, 1948, by the Rev. John A. MacDonald, M.A., B.D., John Burns, M.R.C.V.S., of Dumbarton, to Christina Loui a MacGregor, of Strontoiller, by Oban.

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*Forthcoming Marriage.*—Philp—Preston.—The engagement is announced between John McL. Philp, M.R.C.V.S., Edinburgh, and Ann C. Preston, M.R.C.V.S., The Hall, Donaghcloney, Co. Down.

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*Examination Result.*—Royal Institute of Chemistry: Professor Alastair N. Worden, M.A. (Cantab.), B.Sc. (Lond.), M.R.C.V.S., has been elected a Fellow of the Royal Institute of Chemistry of Great Britain and Ireland.

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R.C.V.S. OBITUARY

Douglas, Alexander, Major R.A.V.C. (T.F.) (retd.), formerly Deputy Chief Veterinary Officer, Animal Health Division, Ministry of Agriculture, 11, Manor Bank, Coupar Angus Road, Blairgowrie, Perthshire. Graduated London, July 14th, 1905. Died December 30th, 1948.

Fowler, Edward James Bennett, Mamelons Farm, Nazeing, Essex. Graduated London, May 16th, 1890. Died December 24th, 1948; aged 81 years.

### Major Alexander Douglas, M.R.C.V.S., D.V.S.M. (Vict.)

The large number of our readers in the Ministry's service and in other spheres of veterinary work who, knowing Alexander Douglas, held him in the deepest affection and highest regard, will mourn the passing of one who struggled bravely against ill-health long before it compelled him, in December, 1944, to retire from the post of Deputy Chief Veterinary Officer which he had filled with such efficiency and distinction since his appointment in 1939.

Born on September 7th, 1882, he was educated at Kilmarnock Academy and Spiers School, Bath, receiving his veterinary training at Glasgow Veterinary College and the Royal Veterinary College, London. After a period of private practice at Kilmarnock (1905-14) he took the D.V.S.M. (Vict.) and entered the local authority's service as County Veterinary Officer for Ayr in 1914. Almost immediately he joined the R.A.V.C., with war service from 1915-19, attaining the rank of Major.

Major Douglas was, in fact, the first whole-time veterinary officer in Ayrshire and was responsible for the building up of the veterinary service in that county. In 1938, with the transfer of functions from the local authorities to the Ministry of Agriculture, he was appointed Superintending Inspector for the South-west of Scotland and in 1939 Deputy Chief Veterinary Officer.

In 1929 Major Douglas rendered the N.V.M.A., of which he was an enthusiastic member, yeoman service as local honorary secretary of the very successful Annual Congress held at Ayr.

Major Douglas was a charming and lovable man, and on behalf of his colleagues in the profession we would express sincere sympathy with Mrs. Douglas and their son and daughter in their grievous loss. Further tribute will be paid in our next issue.

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## Antrycide

### New I.C.I. Compound Effective Against Trypanosomiasis

The Colonial Office and Imperial Chemical Industries made, on December 29th last, a joint announcement concerning the successful synthesis of a new therapeutic agent against trypanosomiasis. Antrycide, which during its field trials was known as M7555, represents the successful outcome of the work of a research team of chemists, biologists, veterinarians and pharmacists. This team was led by Dr. F. H. S. Curd (who was killed in a railway accident at Stockport a month ago) and Dr. D. G. Davey. Both were members of the I.C.I. team which produced paludrine, the anti-malarial specific.

Field trials of the new drug carried out in East Africa and the Sudan have shown that a single dose of antrycide, given subcu-

taneously, has a therapeutic action in cattle affected with *Trypanosoma congolense* and *vivax*. It has also been used with success against *T. brucei* in cattle, horses and dogs; against *T. evansi* in camels; and *T. simiae* in pigs. Studies concerning the prophylaxis of the new drug, which is reported to be virtually non-toxic in large doses, have yet to be completed.

Mr. D. R. Rees-Williams, Parliamentary Under-Secretary for the Colonies, welcomed the discovery as "one of the great advances made in science." While it was intended to continue with the smoke and spray campaign against the tsetse fly, experience had shown that this still left behind a 10 per cent. residue of fly. Antrycide would overcome the effects of this snag, and would make safe for cattle raising an area of 4,500,000 square miles.

Within a few years it would be possible, he said, greatly to increase the cattle population, which, incidentally, would mean that more veterinary officers would be required.

Dr. Cronshaw spoke for Imperial Chemical Industries, and paid tribute to H.M. Colonial Service for their help in this "joint enterprise." He mentioned that Dr. C. M. Scott and Dr. D. G. Davey were still in Africa, but another member of the research team—Dr. W. A. Sexton, F.R.I.C.—had come along to answer any questions.

Mr. D. D. Ogilvie, B.SC., M.R.C.V.S., was also present to answer some of the many questions put. I.C.I. expect next year to produce two or three tons of antrycide, sufficient for 2,000,000 doses. Supplies will be limited to the Governments of the Sudan, Kenya and Uganda. Field trials will later be carried out in West Africa and supplies made available there.

The announcement of this discovery will lend added interest to the International Scientific Conference on Trypanosomiasis which is to be held in London from February 8th to 11th.

G. P. W.

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## "The Veterinary Surgeon and the Dairy Herd"

### Discussion on Mr. Geo. N. Gould's Paper to the Farmers' Club

The *Journal of the Farmers' Club* devotes Part 6 of its 1948 volume to the paper presented to the Club on November 1st, 1948, by Mr. Geo. N. Gould, M.R.C.V.S., of Southampton, who is Hon. Secretary of the N.V.M.A., and to the report of the subsequent discussion, which is fully extracted below. An extended abstract of Mr. Gould's address was published in our issue of November 6th, 1948.

Mr. J. W. Bruford, M.R.C.V.S. (Sevenoaks), President-Elect of the N.V.M.A., in proposing a vote of thanks to Mr. Gould and in opening the discussion, spoke of his colleague as one "who has done so much to make dairy farming a less hazardous undertaking than it used to be." There was a constant cry for greater productivity from our farms, and, with the help of the farming community, veterinary surgeons could contribute much to the maintenance of health in the dairy herds of this country and to the conservation of food.

Mr. Gould had referred chiefly to the major diseases affecting dairy cattle: he (Mr. Bruford) proposed to speak of some of the diseases which, if not collectively, certainly individually, were causing a considerable reduction in the nation's larder and affecting the farmer's pocket and that of the Chancellor of the Exchequer.

Calf diseases and mismanagement were responsible for enormous wastage, and the most common source of trouble was calf scour. There was a vast number of sub-acute cases of nutritional scour about which nothing was done. Over-feeding or bad housing were largely responsible for initiating the disorder, and in many cases dehydration had taken place and a septicaemia had been imposed before professional assistance was sought. Calves coming from markets needed great care for the first few days to get them going.

Other conditions of which diarrhoea was a prominent symptom in calves included coccidiosis—which unless properly diagnosed, would cause stunting and might even lead to death, and parasitic gastro-enteritis and Johne's disease—both of them diseases often arising from infection from contaminated pasture at a most susceptible age. Heavy worm infestation might arise very quickly, depending on the density of the cattle on the ground, weather conditions and the nutritional plane of the calves. In his opinion, it was sound practice to dose the youngsters after they had been out for six weeks or even earlier.

To a warning on the paint-seeking proclivities of calves, Mr. Bruford added one "for those who think rearing of calves by suckling nurse calves is a good thing," citing the several diseases calves may contract from foster mothers.

As to the adult animal, during the past few years great advances had been made in the treatment of the individual—quoting actinobacillosis and foul of the foot—while there had been a clearer understanding of some of the metabolic disorders of cows: *e.g.*, the work of John Barker of Hereford and Dr. H. H. Green of Weybridge, had given the veterinarian a better chance of dealing with the recumbent cow.

Mr. Bruford concluded: It would, I feel, be a pity if, on an occasion such as this, no mention were made of tuberculosis. It is to be hoped that the Ministry's campaign will not now be long delayed. I feel, however, that the farming community as a whole does not realise how much more healthy and profitable would herds be if they were free of this disease. It is my belief that much would be done by farmers to clean up their herds if they were not overawed by building requirements which are expensive, trivial and often unnecessary for the eradication of tuberculosis.

In this modern world, the domestic cow differs considerably from the animal which Nature first gave us. From the day of its birth it is subjected to a variety of stresses and strains for which it was not originally built, and it is not, therefore, surprising that variations from the normal are commonplace occurrences wherever cattle may be. These variations are frequently obscure and complicated, and it requires co-ordinated thinking, backed by experience, to elucidate the problems set by the patient itself often further complicated by unintentional though nevertheless misleading answers from the owner and stockman, stimulated by wishful thinking. Fortunately, the veterinary surgeon engaged in dairy practice sees such a wide variety of abnormal conditions that he acquires an experience to sift the chaff from the corn and to arrive at the all-important diagnosis. The veterinary surgeon, moving as he does amongst cattle of all ages and varieties and kept under all sorts of conditions, can acquire a wealth of knowledge invaluable to his clients.

#### Practical Application of the Panel Scheme

Mr. John Edgar, having seconded the vote of thanks subsequently heartily accorded, said: Mr. Gould has given us in a most comprehensive manner a review of veterinary progress as it affects the dairy herd and has pointed out with clarity the directions in which further progress should be made. I will try to illustrate the effect of the practical application of the Veterinary Panel Scheme to a fairly large herd of commercial dairy cows and describe the results obtained.

Previous to the application of the Panel Scheme to our herd of 150 cows, we had called in our veterinary surgeon only in cases of extreme necessity, and had relied, as many farmers do to-day, on the patent medicine bottle, with results that suggest that many thousands of pounds are spent by farmers in this country to no good effect whatever. We dispensed with the patent medicine bottle and the innumerable commercial travellers as well, decided to adopt the scheme, and placed all facts and records at the disposal of our veterinary surgeon, with whom consultations were held as to the policy to be adopted. We had to establish a basis of confidence between the surgeon, ourselves and, by far the most important, our men who, I must say, responded in a most excellent manner to the suggestions made and applied themselves to an arduous and long task, of the success of which no one is more proud than they.

Mastitis was probably our worst disease, with abortion and consequent infertility only slightly behind. Some of the worst cases of mastitis were disposed of to the collecting centre, but many were retained for treatment with sulphanilamide, now superseded by penicillin, and although our results at first were not spectacular we persisted, and by the time penicillin treatment had become generally available we had practically freed our herds of mastitis.

Real progress was made, I repeat, by the never tiring efforts of our men and the detailed and intensive treatment recommended by our veterinary surgeon. Had we had in application the milking system which we are operating to-day and the benefits of progress made by veterinary science since that time in the treatment of mastitis, our job would have been made easier. As it was, by the gradual eradication of this disease we increased our milk production by 30,240 gallons on last year's production, as compared with our production on going over to the Panel Scheme. This represents an increase of 200 gallons per cow per annum attributable to effective control of disease, for our management as regard feeding and general practice was, I venture to say, quite good.

We found, however, that we were getting some recurrence of mastitis amongst the old chronic cases, and we looked for further measures to prevent any return of the trouble. We overhauled our milking system on similar lines to the system Mr. Gould has described, and introduced a policy of pencillin injection in the drying-off stage which I will describe.

Every cow in our herd, whether she has had mastitis or not, is injected with penicillin in each quarter on two consecutive days as she is dried off. We have, we believe, obtained considerable benefit from this method, resulting in the recovery of udders hardened by previous mastitis infection and which yielded greater

production in the following lactation, but we also consider that the system has a value as a preventative as well. I can show you cows now doing their 1,000 and 1,100-gallon yields which five years ago gave as little as 400 and 500 gallons because of mastitis.

With the introduction of a quick milking system—and we have much to thank Professor Petersen for in this matter—we dispensed with the expensive hypochlorite disinfectants which we had believed were an integral part of our mastitis control and introduced the separate udder cloth method, with sterilisation by boiling of the cloths between milking, in an electric copper. This system has much to be said for it on the grounds of economy, apart from its higher degree of efficiency. £154 per annum is being saved in our herds by dispensing with hypochlorites, and the expenditure on the large number of udder cloths needed is well saved by their far greater period of usefulness, for they are not damaged in the same way as they are by the hypochlorite solution. The electric copper ensures that the udder cloth is at the right temperature, whereas when hot water is drawn off into a bucket for the udder cloths under the old system, the temperature varies considerably between cows.

Furthermore, it is much cheaper to heat the udder cloths only once, in the copper, than to raise water to heat at intervals as required for the udder cloth buckets, and an annual saving in electricity cost to the amount of £55 has been made. Non-stripping and a completely reorganised cowshed routine, incorporating much that you heard in Mr. Gould's paper, have enabled us to dispense with one operator, actually a land girl, in each herd. It is estimated that our total milk production costs have been reduced by £550, or between £3 and £4 per cow per annum, through the saving in labour, electricity and hypochlorites.

The systematic hygienic control now in use, with its quicker milking, no stripping and the absence of handling of the teats by the operator, together with the penicillin injection during the drying-off period, has completely solved our mastitis problem. Non-stripping, if adopted, must be persisted in. I am satisfied that 99 per cent. of cows will respond.

Much more spectacular success was obtained in the treatment of abortion and sterility. Each cow was vaccinated with S.19 strain after calving for two consecutive calvings—incidentally, this policy is still followed—cows showing any discharge were held back from service, and treated, as were any cows failing to hold to three services, and those cows which had aborted were treated and kept in isolation. Our results were astonishingly good. Cows again began to calve their calf a year, and the long dry periods produced by infertility were reduced. Artificial insemination was brought in to prevent any spread of infection by the bulls, and the results obtained with a 69·9 per cent. conception rate to the first insemination and a final conception rate of 98 per cent. indicated the efficiency of the A.I. Centre, and that the other measures adopted had been wholly successful. The measures against abortion and sterility used then are still in use to-day.

In conjunction with the disease control scheme, a policy of ploughing up the remaining old pastures was followed, until in 1947 virtually no permanent pastures remained. The contribution which the clean new leys made to controlling the disease problem cannot be specifically measured, but I give it as my opinion that it played a part far larger than might be estimated, and I would strongly urge those who have disease problems to follow a similar policy in regard to their grassland.

It was necessary to keep accurate but simple records of all calvings, inseminations, vaccinations, treatments, etc., together with milk records, in order to record progress made and to decide action to be taken. Each cowman kept a diary in which he recorded all occurrences in his herd daily; he then each week filled in a report sheet suitably printed with columns for each type of information required. This information was then taken off in the office on to a card for each individual cow. It was therefore possible to follow the position of that cow at any time when required. The value of these accurate records enabled treatment to be given at correct times, and made it possible for our veterinary surgeon to maintain a control over the programme with greater ease and efficiency.

It is interesting to state that in the first two years of the scheme, when the incidence of disease was high, our percentage of wastage from the total herd was 34 per cent. and 38 per cent. respectively, whereas in 1947 our wastage was 16 per cent., and up to date this year the figures indicate a wastage of 18·5 per cent. What is more revealing is that this year more than half of the cows disposed of have been sold because of low milk production and not because of disease, a step we were not able to take under any conditions when in the period of bad disease incidence, and this is a factor the importance of which I wish to emphasise in its relation to total annual milk production.

When disease control is achieved it is possible to cull on a production basis, but not before. The average number of calvings per cow in our herd to-day, including first calf heifers, in the average, is over four calves per cow, whereas formerly we were not keeping our cows as long as the Milk Marketing Board figure of 3·1. Cows calving their fifth and sixth calves are now numerous in our herd, whereas formerly they were the exception.

Mr. Gould has mentioned two prevalent troubles amongst cattle to-day, namely, bloat and parasitism, which are worthy of the fullest possible investigation by research bodies. We know all too little about the measures to control bloat, and in a year when husk is particularly rife amongst young cattle the necessity for the production of a drug to destroy the husk worm in its immature state in the stomach before damage to the lungs occurs, becomes a matter of urgent importance. It appears most desirable that young cattle and adult stock should not graze the same pastures if husk is to be avoided, for all too often, unknown to the owner, the dairy herd harbours the parasite, and young cattle following them at later grazing quickly develop husk, with consequent loss of condition and, if prompt action is not taken, death may result through pneumonia. It is not easy to maintain young cattle entirely separate from the older stock, and I therefore wish to impress the importance of the production of a suitable preventative.

The seconding of this vote of thanks has given me the opportunity of describing how it is possible to establish a policy of co-operation between the farmer and the veterinary surgeon which can achieve good results even in a herd where disease was very bad. It is not generally appreciated how valuable is the advice of one's veterinary surgeon on all matters affecting livestock management and how, if that advice is taken and made use of, so often "prevention is better than cure" becomes not a saying but a practice. Little success can be obtained in any herd in disease control unless farmer and veterinary surgeon realise one another's problems and map out a policy based on what is practicable under the circumstances.

Too often, I am afraid, suggestions made by the veterinary surgeon are not taken up by the herd owner, sometimes because they are difficult to bring into operation; and I therefore repeat that it is vitally important that the farmer and the veterinary surgeon should discuss together all matters relating to a particular disease problem so that a decision may be reached which is, on the one hand, practical from the farmer's point of view and, on the other hand, assured of reasonable success from the veterinary surgeon's point of view.

Mr. Gould's paper should bring home to farmer and veterinary surgeon alike the need to get together, and it has, I feel sure, shown how by effective disease control a large-scale increase in animal and animal products production is possible.

### General Discussion

In the general discussion Mr. G. Harcourt, the first speaker, testified to the value of the Panel Scheme and expressed regret at its termination. As will be seen from his reply, Mr. Gould rectified this misapprehension.

Mr. A. D. J. Brennan, M.R.C.V.S., referred to Mr. Anderson's statement at this year's N.V.M.A. Congress that the first essential for the eradication of tuberculosis from our herds was the immediate abolition of the Attested Herds Scheme. He took it that that opinion was not shared by Mr. Gould and he was puzzled at this divergence of opinion by two of our most eminent veterinary surgeons as to what should happen until such time as the Government produced an eradication scheme.

Mr. G. Eyre (London) asserted that mastitis and other diseases of dairy cows were due to the unnatural forcing for high milk yields. The pooling of practical experience in this matter would be invaluable.

Mr. Hay (Ministry of Agriculture) wished to hear more from Mr. Gould on the effects of the leys and of the ploughing-up policy, with particular reference to parasitism; on those of the continual swilling down with water and the cows lying on cold concrete; also his views on the milking parlour and the yard versus the cowshed.

Mr. J. K. Dreaper (Berkshire) thought that the confidence of farmers generally in the tuberculin test had been severely shaken. Mr. Gould had said that there was now available a reliable diagnostic tuberculin; he sincerely hoped so, as the progress of the Attested Herds Scheme was handicapped not so much by the cost of building requirements as by fear of the test. Mr. Dreaper quoted his testing experience, to which Mr. Gould referred in detail in his reply (*q.v.*).

Mr. W. Rathbone (Hampshire) expressed surprise that no mention had been made of sub-clinical mastitis. Like almost everybody else, he had had his dose of mastitis, and he had now adopted a system which had helped him very much, and which might be of interest generally. Every cow that calved, irrespective of whether she had shown any signs of mastitis or not, was kept off the machine and kept, as far as cowshed accommodation went, entirely

separate from the rest, until, as soon as she came on the sheet, a quarter sample could be taken from each quarter and sent to a laboratory. This might sound complicated and expensive, but in their experience it had been very much cheaper than what they had before in the way of mastitis. They were able to get at every case of mastitis early.

They milked by machine, and felt that the milking machine was probably the best way of spreading mastitis through a herd that anybody could devise—probably even better than the hands of the hand-milker! They found it possible to make arrangements that these cows which were waiting for test should be milked either last or by a different person from those who were doing the machine milking. Did Mr. Gould consider that process advisable, or that they were exceptionally lucky in being able to find a laboratory which could do that for them as a regular practice.

Mr. J. Mackintosh (Berkshire): Listening to Mr. Gould, Mr. Bruford and Mr. Edgar had helped him to get a better picture of the many points involved in herd management. They had often spoken in the past of herd improvement as consisting of breeding, feeding and management. It was fairly easy to know what improvement in breeding meant, although very difficult to do it. It was fairly easy to know what improved feeding meant, and it was often not difficult to do. It was easy to say that they ought to improve management, but difficult to know exactly what was meant. Now they had a much better picture of what was meant, and he was very thankful to all the speakers for their outline, which was very good as far as it went. He did not think it was quite complete, because the points needed to complete it were outside the realm of veterinary work.

Mr. Gould said that hand-stripping must cease. He did not say when! It would perhaps be possible for all those who hand-strip to stop to-morrow morning but would that be right? It seemed to him that hand-stripping ought only to cease when the practice of machine milking was up to a really high level, when the machine was operated with the maximum efficiency and the technique of machine-stripping by pressure on the claw was properly understood by the operators.

Mr. G. Reginald Reakes (Somerset): Would Mr. Gould agree that most mastitis was caused by bale milking? Much of the trouble was due to mass production and rush methods. He started with a milking parlour and got into any amount of trouble. He then hand-milked for a period, and afterwards went on to a bucket plant, since when he had had no trouble from mastitis. In the bale, when a cow had a questionable udder, the herdsman saw the governor coming along and said "Hurry up this with this cow, or we shall be here all night." In the case of the bucket plant, one could give each cow individual attention without holding up milking operations.

Mr. H. W. Bala (Visitor): Mr. Gould dealt with the preventive aspect of stomach worm in calves: was there a cure?

Mr. E. J. Boston (Oxfordshire) drew attention to the enormous variation in the requirements of different local authorities in regard to T.T. buildings. The difference that existed was very deplorable. In some districts Attested Herd licences could be obtained easily even with wooden buildings, whereas in other districts wooden buildings were absolutely forbidden. This was very unfortunate, because first-class Attested standards could be attained even with wooden buildings.

Did Mr. Gould recommend that disinfectants and hypochlorites should be cut out altogether in the disinfection of udders and in washing milkers' hands? Would he recommend just soap and water as being sufficient?

What was his opinion on the difference between the simple ley mixture and the complicated ley mixture? He personally had found the simple ley mixture very unsatisfactory, and a more complicated ley mixture did seem to be the answer to the question of how to get a long-lived dairy cow.

Was there any danger in the use of penicillin as a preventative of mastitis? Would they not be running some danger of losing the animal's response to penicillin?

Major A. A. Kidd (Oxfordshire): Exactly what form of calf management did Mr. Gould recommend in order that the calf might get the colostrum and not become infected with Johne's disease and parasitism?

Would Mr. Gould tell them of his experience of "husk" (parasitic bronchitis) this year? They had had it very badly in their part of the world in adult cattle.

### The Reply

Mr. G. N. Gould: Mr. Bruford's address was complementary to his own and served to indicate the tremendous scope of veterinary practice. They had the pleasure of hearing from Mr. Edgar what disease control had meant to him.

He agreed with Mr. Bruford that coccidiosis in young stock was much more prevalent than was generally realised. Diagnosis could be confirmed microscopically, and the condition responded well to treatment by modern therapeutic agents.

In regard to Johne's disease, Jersey had been fortunate in a way, in that Johne's disease was dealt with as a scheduled disease: it might become so in this country one day. Mr. Bruford mentioned that some people were doubtful whether cows which did not show any symptom of the disease until they were two and a half or three years old could really have been infected before they were six months old. We could be quite certain that many cows with Johne's disease never broke down into clinical cases at all, and went through their life as carriers. It was when the infected cow lost resistance from some cause that she broke down. That was why this breaking down very often occurred at a comparatively advanced age.

The segregation of young stock was, of course, the solution to a great extent of the problems of Johne's disease, parasitism, and also of tuberculosis. The nucleus of an attested herd could be built up by care in the raising of young stock even from a herd of reactors. In the case of parasitism, there was the difficulty that the adult animals, having acquired immunity, could transmit the infection, being carriers of it, although showing no symptoms themselves, and in that way infect the pastures, and consequently the young stock grazing off them. This directed attention again to the necessity, where it was practicable—and it was practicable on some farms—of segregating young stock. In spite of the fact that older animals did sometimes break down—Mr. Bruford mentioned a bull of 18 months which broke down, whereas young stock which had been exposed to infection did not break down—age and acquired immunity were important factors.

Foul in the foot was a very troublesome condition and responded very well to injection treatment in these days. Unfortunately modern therapeutic treatment was expensive—it was necessary for farmers to realise that modern therapeutic agents were usually expensive items, but they gave results.

"Mr. Bruford mentioned metabolic disorders," Mr. Gould continued. "In this connection last week the National Veterinary Medical Association held a Grassland Conference at which representatives of the veterinary profession and the agricultural scientists met to discuss the many problems which we are meeting. I think that some good will emanate from our joint efforts in the future.

"Mr. Bruford also mentioned tuberculosis eradication. I am sure that that is an economic policy. I am also sure that on each individual farm the policy must be one that is mutually agreed upon as being practical and capable of application by the veterinary surgeon and the farmer. There are many factors to be taken into account in deciding on plans for eradication on the individual farm.

"Mr. Edgar stressed that the management of his herd before he started applying the recommendations of the Panel Scheme for disease control was good otherwise. That is a point that has to be borne in mind. If you do not include disease control in your management, your management cannot be really good.

"One of the most important factors is co-operation between the veterinary surgeon, the farmer and the men. It is amazing how enthusiastic the men become when they find that they are getting results. They look upon it as a matter of personal pride to avoid trouble, and they are most anxious to get things done at the earliest possible moment.

"With regard to leys, while Mr. Edgar and Mr. Bruford have attributed much to leys, I think the great value is the higher nutritional value of the sward produced. Where we have had trouble I do not believe it has been so much the fault of the leys as of the management. This is where advice is wanted from the grassland experts and veterinary surgeons.

"Another factor which Mr. Edgar stressed was the importance of records. It helps a great deal if they are properly maintained. In a busy veterinary practice one would need a whole staff of clerks if one had to maintain records for every client. It helps if the individual farmer shows that intelligent interest which enables him to appreciate what he is getting for his money—and how little, proportionately, he is paying for it.

"I think Mr. Edgar was quite right when he said that without disease control you can never achieve selective culling in the herd. I think that if we could get 20 per cent. of the herds of the country into the position in which selective culling was possible, the production problems in regard to milk and dairy produce in this country would be solved. Automatically, over a period of years there would be an improvement in the standard of even the worst herds, since they would buy the culls which would be likely to be free of some disease risks and of gradually improving productivity.

"Mr. Edgar emphasised the need for mapping out policy on the farm. That is a very personal matter, and one of confidence between the individuals concerned. I am quite certain that it must stay that way. It is not a bit of good issuing directives, and so on, until they have been discussed. People do not read things—it is necessary to get together and talk things over.

"Mr. Harcourt asked why the Veterinary Panel Scheme ceased. It is not at an end. Some veterinary surgeons are still carrying on. The difficulty is that the scheme was introduced as a war-time measure in order to effect the greatest possible control of these diseases and improve production as far as possible; but with the advances in therapeutic measures and our knowledge of the diseases concerned, the provisions regarding treatment which were laid down in that scheme, and which we thought were excellent at that time, have become obsolete in many instances. Nowadays, if you try to run the Panel Scheme, I find you have to have so many provisos that you do not know where you are, and nor does the farmer. The best procedure is, in my view, to cut out the official scheme and control disease in herds by private arrangement between the farmer and the veterinary surgeon until the National Veterinary Medical Association, the Ministry of Agriculture and the National Farmers' Union can devise a new scheme. Those three bodies are in process of attempting to do that at the present time, but there are great difficulties.

"Mr. Brennan mentioned the remarks of the retiring President of the National Veterinary Medical Association in regard to tuberculin testing and the Attested Herd Scheme. The retiring President stressed that his remarks were his own personal views and, like others who have been active Presidents of the N.V.M.A., he was, I should imagine, very tired of the slowness of the Ministry of Agriculture in making any apparent progress with this problem, or even in discussing it with the veterinary profession. I do not agree with the past President's remarks—that will be obvious from what I have said to-day—and I doubt very much whether very many people in the profession agree with his views on this matter, but at the same time what he said may possibly stimulate official action. The matter has been mooted for several years, and we were even sent a draft scheme. It is time something concrete was done."

Mr. Harrod, of Cheshire, had spoken of the mastitis problem and the washing down of concrete floors. He (Mr. Gould) believed that in winter time, with cows lying in, clean bedding on the floor was advantageous; nevertheless, washing down was essential. He would rather have a clean cowshed than a dirty one, plus the excuse that the dirt was there to provide warmth. He disliked the American method of sprinkling phosphate or some other fertiliser on the floor to facilitate removal of dirt and dung. He had seen this tried, and had found that in a short time there was a considerable amount of dung sticking to the floor. The American system was valuable in the extremes of winter temperature met with in that country.

There was a reference by one gentleman to the need for getting back to Nature. "Those who talk about leaving things to Nature should look around them and see how much is left to Nature in the case of the human race. For instance, we begin our lives by drinking milk, but we do not all continue on that beverage—yet the span of life is increasing, and in some cases appears far too long!"

Mr. Hay, of the Ministry of Agriculture, had made an interesting contribution. He was sure they were in no disagreement but, perhaps there might be some misunderstanding because he (Mr. Gould) had dealt with the question of leys very superficially. He did not attribute increased parasitism directly to the leys, but to faults in management. The added nutritional value of the ley probably helped in the resistance to infection. There was no question but that more concentrated stocking and the increased length of time stock were on the individual ley did materially assist in that intensive infection which was not uncommon to-day. That again was a fault of management.

Mr. Bruford and Mr. Edgar made the point that properly managed leys were associated with improved health; everybody would agree with that. Properly managed leys were associated with improved health because of the higher nutritional value of the sward and the greater amount available, but there had to be good management to get the best results.

With regard to the question of the milking parlour and yards versus the cowshed, he liked the milking parlour from the point of view of ease and hygiene of milking, but if one had cowsheds available and had to use them, it seemed to him to be a terrific waste of time to tie the cows in the cowshed in the winter time and then to put them through the milking parlour and tie them up again. This was the system which was adopted on many farms where farmers had been induced to put in parlours. Where one had the yards the system is the right one, and he was very much in favour of them. He thought that yards, particularly if stock were dehorned, but not otherwise, lent themselves to economic and good maangement.

Mr. Gould proceeded: "One speaker cast some doubt on the T.T. test because for five years or so he has had a T.T. tested herd and then he had a bull react, according to one veterinary surgeon who tested it, although subsequently the Ministry re-tested and found it all right. Then again in the next year the same thing happened. I should not regard that as being a reason for breaking anyone's faith in the test. I am quite certain that an intelligent explanation could be obtained from the Ministry as to why they passed the bull and why they did not consider that whatever reaction it showed was, in fact, due to bovine tuberculosis. It must be remembered that a diagnostic test is not something that is stuck into a cow and that thereafter everything goes by clockwork. There has to be a certain amount of intelligence and understanding of other factors in the interpreting of the test. I say that the present tuberculin is a very reliable diagnostic agent, properly used, and I think one that we can use with every confidence in combating and eradicating tuberculosis from our dairy herds.

"Mr. Rathbone dealt with sub-clinical mastitis. He said that quarter samples were taken from all cows that came into his herd and sent to a laboratory, which gave a report. He did not tell us what he did when they came back positive. I expect he used penicillin. Quarter sampling is a very good system if it fits into the organisation and provided there are adequate laboratory facilities available. But imagine what would happen if three million-odd cows were subjected to that method of control. There simply are not the laboratories to do the diagnostic work we want them to do already, without inflicting quarter sampling on them; and, of course, there is the economic factor of cost to be considered.

"Another point to be remembered is the ease of reinfection. The fact that one quarter sample is passed means that at the time the sample is taken the quarter is probably free of infection. A sample every month might show a different picture. I believe that anyone adopting Mr. Rathbone's method of control would be well advised to go in for total eradication on the lines suggested by Dr. Stableforth.

"I am very glad to know that Mr. Mackintosh believes that we have done him some good by our discussion to-day. Mr. Mackintosh is an authority on herd improvement, and I am very glad to have been able to provide the missing link in his programme and teaching. The missing link, as he said, is disease control, and there is no question about that. The sooner it is generally realised the better. Disease control can effect tremendous improvement in the herds of this country.

"Then he raised the question as to when hand-stripping should cease. I could not put all the details in my paper, but I fully agree with Mr. Mackintosh when he says 'When machine-stripping has become efficient.' The attaining of efficiency in machine-stripping is not difficult under the system of hot milking recommended. There is little to strip. I doubt very much that the average man or girl using a machine cannot acquire the art within seven days. It will vary within days with the individual cow. I do believe that hot milking is an indispensable part of the programme if you are to strip all cows efficiently by machine.

"Mr. Reeks, of Somerset, dealt with the differences in the incidence of mastitis in the bale and bucket plant. What he said reflects what I have been trying to emphasise, namely, that management is the thing that counts. Where you get a breakdown in management in the bale, in the cowshed or in the milking parlour, you get reduced production. You have to adapt your policy on the farm to the facilities available. There is no question that on some farms bale milking is the only system which can be readily and economically applied and, in addition, fit in with the system of farming.

"A gentleman who said that he had 50 years of experience asked about a cure for husk. I am afraid I cannot go into very great detail on this. I think he ought to ask his own veterinary surgeon for that information—and pay for it! But pasture management can effect a considerable improvement. The grazing of young stock after old is a bad policy, because of the infection left by the older stock, which may show no symptoms themselves. Reasonable rotation of pastures, so that the parasitic infection is considerably reduced before the stock returns to graze it again, is good policy in my experience.

"Mr. Boston dealt with the difficulties, which are not uncommon, in dealing with the licensing authorities and other civil servants. I agree with him. I think that some of the demands of the licensing authorities are too ridiculous for words, and the sooner the National Farmers' Union and the farmers themselves get up in arms and say that they will not stand any more, the better. My own particular county is a bright spot where the authorities show great commonsense and are keen on eradicating tuberculosis. There is on the Statute Book an Act which is intended to establish uniformity, but the date of implementing the Act has recently been postponed again."

He had been also asked a question about cutting out hypochlorite in the disinfection of milkers' hands. He had cut it out altogether, not necessarily because hypochlorite might not be of some value, but because it was difficult to ensure that the optimum amount was used as recommended by the manufacturers, so that it would not hurt the hands or the cows' teats. Many cowmen thought that a

couple of "dollops" would do better than one. If that was done, in his experience, there was a tendency to get chapped and cracked hands and teats, and these were very vital factors in mastitis transmission. He was quite certain that they had lost nothing by cutting it out—and they had effected great economy in overhead costs. Results had justified dispensing with hypochlorites, and that was the real test.

There was no doubt in his mind but that efficiency of milking methods and management could make the greatest contribution to the rational control of mastitis.

With regard to bloat and the simple ley mixture versus the more complicated ley mixture, if Mr. Boston had been at the Grassland Conference he would have sat there for two days and still not have received an adequate answer to his question. He believed that we had a great deal to do yet in sorting out the problem of what are and what are not best grass mixtures, but he would not dissuade any farmer from ploughing up old grassland. The sooner the better. Let them have good grassland, but remember leys required individual discriminating management to secure the optimum benefits.

With regard to the use of penicillin producing loss of resistance in the cow, he would not agree with that. Dr. Stableforth's remark on that point was that an infected quarter which had been treated with penicillin and made a bacteriological recovery appeared to be more readily infected subsequently, when exposed to infection, than a quarter which had never had mastitis.

With regard to calf management and the avoidance of diseases associated with suckling, such as Johne's disease, he had said in his paper that calves should be weaned at birth in herds in which the disease was known to exist. The udder should be cleansed before drawing off the colostrum and fed to the calf. Subsequently the udder should be thoroughly cleaned prior to drawing off the milk for the calf, and be followed by a gradual change-over on to milk substitute, according to the system adopted.

He was asked whether he had had any experience of husk this year in adult cattle. Husk had been very troublesome this year, and the climatic factors had, of course, aggravated the condition. Climatic factors were very important in all parasitic infection. He had seen husk in adult cattle, but thought that where adult cattle developed clinical husk there was likely to have been a gross breach of good management. If the stock was kept on a reasonably high plane of nutrition, and if the pasture management was satisfactory, there would not, in his opinion, be husk in the adult stock.

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## ANIMAL HEALTH TRUST APPEAL TO BREED SOCIETIES

An appeal to all Breed Societies in Great Britain has been made by the Animal Health Trust for financial assistance in the development, now proceeding, of the Trust's Farm Livestock Research Station on the Houghton Grange Estate at St. Ives, Huntingdonshire. Already much work has been involved in adapting the buildings at Houghton Grange for purposes of research, in procuring the essential equipment and in recruiting scientific and lay staff—activities which are being pressed forward as rapidly as present day difficulties permit.

Members of the Breed Societies, numbering many thousands, are asked to play their part by contributing towards a cause which will in the end raise the standards of livestock production and will give the nation more and better food, and at the same time help Great Britain to maintain her unique position as the world's premier livestock exporting country. "The demand for British pedigree stock of all kinds depends—to an increasing extent—upon its freedom from disease."

On its part, the Shorthorn Society of Great Britain and Ireland has authorised the circulation of an appeal from the Animal Health Trust to its individual members, an action which might be followed by other societies controlling the destinies of the nation's pedigree breeds.

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Three new county organisers for the Animal Health Trust have been appointed as follows:—

Yorkshire—Mr. J. O. Powley, M.R.C.V.S., recently retired superintending inspector of the Animal Health Division of the Ministry of Agriculture.

Berkshire—Major J. M. Smith, M.R.C.V.S., at one time chief veterinary officer for Palestine.

Kent—Lt.-Col. H. G. N. Leakey, recently retired from the Indian Army.

## ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

*Denbigh.*—Burnaize, Trawscoed Road, Llysfaen, Colwyn Bay, Denbighs. (December 20th).

*Flints.*—The Paddock, rear of Marsh Hotel, Rhuddlan (December 23rd).

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## AGRICULTURAL ADVISERS TO U.K. HIGH COMMISSIONERS IN AUSTRALIA AND NEW ZEALAND

The Agricultural Departments and the Commonwealth Relations Office announce the appointment of Mr. C. W. Strutt, B.Sc. (Agric.), to be Agricultural Adviser to the United Kingdom High Commissioner in Australia and of Mr. D. S. Hendrie, B.Sc. (Agric.), N.D.A., N.D.D., to be Agricultural Adviser to the United Kingdom High Commissioner in New Zealand. These are new appointments, although a similar post has existed in Canada for some time.

Mr. Strutt will perform the continuing functions of the post vacated at the end of December by Mr. R. E. Hewat, the British Ministry of Food representative in Australia. Mr. Hewat will rejoin his firm, Messrs. Lovell and Christmas, Ltd., at whose request the Ministry of Food are, with regret, releasing him.

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## VETERINARY NOTES FROM INDIA

We learn through Rai Bahadur Nanda, M.R.C.V.S., Animal Husbandry Commissioner with the Government of India, that three new veterinary colleges or, as they are designated, animal husbandry colleges, have been opened at Muttra (U.P.), Jubbulpore (C.P.) and Nowgong (Assam). These, as well as the original colleges, are being affiliated to universities. One of the new professors is Mr. S. B. Singh, M.R.C.V.S., who is teaching in the Muttra College.

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India's representative at the F.A.O. Rinderpest Conference, held at Nairobi in October, was Dr. S. C. Datta, Director, Indian Veterinary Research Institute.

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A new cattle farm has been established by the Central Government at Jubbulpore where, under the guidance of animal geneticists, experimental breeding will be undertaken with the immediate object of studying the inherited qualities of the main cattle breeds of India and with the ultimate object of evolving a general utility breed. The farm covers an area of about 3,000 acres. The breeds to be used are the Malvi, Gaolao, Nimari, Sindi, Sahiwal and Tharparker. Some Red Sindis have been purchased from Sind, Sahiwals will be transferred from the Dairy Research Institute, Bangalore, and the Central India breeds are now being bought.

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## SHORTAGE OF VETERINARY SURGEONS IN AUSTRALIA

There are only 400 veterinary surgeons in Australia and the following information, culled from the Organ of the Primary Producers' Union in New South Wales, indicates the urgent need for facilities for the training of more graduates at home, if we are both to meet our own requirements and send adequate reenforcements of qualified men to meet Commonwealth shortages.

The Union's executive committee agreed to a motion asking the Government of New South Wales to subsidise the cost of veterinary services to primary producers. Moving, Mr. J. O'Meara said such a scheme, subsidised through factories, would be of great benefit to primary producers.

The general president (Mr. Gibson) said when a scheme started it expanded, but the trouble was to get veterinary surgeons. The solution appeared to be to have semi-trained men operating under veterinary surgeons. There was only one chair of veterinary science in Australia—at Sydney University: such training cost a great deal to establish.

The demand for veterinary surgeons seemed likely to last twelve years at least, he added.

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Milk output continues at record levels. The Milk Marketing Board have announced that during November 110 million gallons were sold by dairy farmers, 15 million gallons greater than the previous record for November and 30 million gallons greater than before the war.

## LEGAL NOTES

*Bull Licensing Charge Dismissed.*—After a long hearing, Morpeth magistrates dismissed a case in which a Felton farmer was charged with keeping a bull which had attained the prescribed age, without having a licence in force. The charge was brought under the Improvement of Livestock (Licensing of Bulls) Act, 1931, and the Licensing of Bulls (England and Wales) Regulations, 1934, and a police superintendent, prosecuting, said that the main object of the Act and Regulations was to effect an improvement in the standard of cattle throughout the country. These regulations made it compulsory for any person keeping a bull to get a licence for it when the animal was ten months old. Application for such a licence should be made 28 days before the bull reached that age.

In this case it was alleged that the defendant (a Mr. Turnbull) sold a white shorthorn bull to Mr. Farr, a farmer at Alnmouth. In the opinion of Mr. Farr, the animal was about two years old. When the animal was slaughtered at Alnwick it was alleged that it was discovered by the slaughterman and manager to be a bull; it was treated as a bull for record purposes and Mr. Farr was paid at bull price.

For the defence it was stated that the animal was sold as a bullock and therefore no licence was required. Defendant's solicitor also submitted that the examination of the animal should have been carried out by a veterinary surgeon.

* * * * *

## STALLION LICENSING "LOOPHOLE"

"The new regulations relating to the licensing of stallions are not what the Clydesdale Horse Society, or probably what other breed legislators, hoped to have introduced. There is a serious flaw in the system provided for in the new Act," observes the *Farming News* in its issue of December 31st, and continues: "Whereas the intention of the Clydesdale Society was that all stallions, whatever their age and whether travelled or standing at home, must be licensed, the regulations, so far as we know, will not prevent an unlicensed stallion operating at home if he is already five years or upwards.

"When the breed societies were consulted, they expressed themselves favourable to a new set of conditions that would bring all heavy stallions within the net of licensing. But the recent announcement explanatory of the change implies that no horse already over five years which is not already licensed will have to obtain a licence.

"That is a serious loophole. If unsoundness in breeding is to be stamped out, every stallion whether over or under five years old, ought to have been covered by the regulations. In time, of course, the new rule would effect comprehensive licensing. Meantime it does not do so."

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The American Veterinary Medical Association is organising a conducted tour of western and northern Europe for American veterinarians and their families in connection with attendance at the 14th International Veterinary Congress in London in August.

## CORRESPONDENCE

*The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.*

**Correspondents are requested to write as briefly as possible.**

### OBSERVATIONS ON CANINE ENCEPHALITIS

Sir,—Dr. Montgomerie, in replying to the discussion on the most interesting paper, which he with Mr. MacIntyre and Dr. Trevan presented to the Southport Congress (*Vet. Rec.* **60,** 647), suggests that the terms "ill-nourished" and "well-nourished," which I used (advisedly) in speaking of the relation of nutrition to virus infections, are hard to define. This is indeed true under natural conditions, and renders the interpretation of clinical observations of nutritional status beset with many pitfalls.

However, these terms can be defined precisely when based on careful experimental studies. It was to such studies that I was referring; the results with neurotropic virus infections in small laboratory animals on purified diets do bear close scientific scrutiny. The work on experimental dietary canine-hysteria has shown that dogs can be maintained successfully on similar purified diets and that their nutritional status can be fully controlled. Thus the knowledge on the nutritional side is available to verify experimentally the role of nutrition in these "encephalitic" diseases of the dog. Since there was no time to elaborate these matters at Southport nor space to do so here, I must refer Dr. Montgomerie to my recent papers (*Proc. Roy. Soc. Med.* **41,** 324; *Vet. Rec.* **60,** 466; *Lancet*, 1948, **1,** 32) for the relevant details.

All of us are looking forward with keen interest to the publications giving full details of the work carried out at Langley Court, and in particular the studies on the sulphonamide potentiation, and the detailed protocols and pathological studies of Dr. Trevan. The Annual Congress hardly seemed a suitable occasion for a detailed discussion of the technicalities of neuropathology.

Yours faithfully,

Kennett, HERBERT PARRY.
Barrow,
Suffolk.

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### DISHORNING BY RUBBER LIGATURE

Sir,—May I comment on the above subject in view of suggestions made in recent letters to the *Record* as to the legality and cruelty involved by the use of this method? I am personally quite satisfied that the procedure can be carried out, at the worst, with only a slight degree of discomfort to the subject.

A long-acting local anaesthetic (Hewlett's "Anaesco"—procaine in sterile almond oil—answers this description) is used to nerve-block both the main nerve trunk and the collateral branch. This completely destroys all sensation, the cow starting to graze immediately when turned out after applying the ligature. The effect of the ligature itself is to destroy all subsequent sensation after effects of the nerve-block injections have disappeared. In fact the ligature thereafter acts as a local anaesthetic. This has been confirmed in my hands in some 150 to 200 cases. In no case has a diminution of milk yield been met with throughout the entire period during which the ligature has been *in situ*. This one fact is, to me, very strong evidence of the absence of pain. This is in marked contradistinction to one's experiences in an appreciable proportion of cases when dishorning is carried out by the accepted methods using either general or local anaesthetics followed by the saw or guillotine. It is frequently all too obvious in these latter cases that the cow *does* suffer pain on the return of sensibility. Another somewhat unexpected result of ligation is the absence or slight degree of suppuration—when carried out during the winter months.

I have not yet seen cases of "wobbling of a partially attached horn on its sensitive core." Might one suggest that the *bony* horn core is probably not sensitive? Experience in the use of this method would appear to bear this out. In some few cases there had been some signs of slight discomfort, again without any loss of milk yield, at about the fifth week. These have been dealt with by again nerve-blocking followed by a sharp tap on the horn tip which has completed the dishorning process without the infliction of pain.

While one must admit that we have still much to learn, one fact stands out most prominently, namely, the inherent humanity of the method as opposed to accepted "legal" and "humane" methods. I have myself made little use of rubber bands but prefer to use 3/16 in. rubber cord very tightly applied two or three times around the base of the horn at the hair-line.

In conclusion, might I suggest that the Officers of our Association and any other persons interested should withhold judgment until the whole subject has been thoroughly explored.

Yours faithfully,

Derby. EDWARD WILKINSON.

[The fact remains that a prosecution—though not necessarily a conviction—might follow the use of this procedure, it being for the Court to decide the question of cruelty.—EDITOR.]

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### NUTRITION AND RESISTANCE TO INFECTION

#### Foot-and-Mouth Disease

Sir,—Since the publication in your columns (*Vet. Rec.* **60.** 466) of my recent annotation on "Nutrition and Resistance to Infection," my attention has been drawn to J. T. Edwards' work on the virus of foot-and-mouth disease, which provides further support for the view that in virus infections the resistance of the ill-nourished is greater than that of the well-nourished animal (Parry, 1948). Although summaries of this work have appeared (Edwards, 1937b; Edwards, 1937c), the original paper is not readily accessible (Edwards, 1937a). Since this work does not appear to be widely known, I feel that attention should be directed to it, especially as the paper records one of the earliest experimental studies on the role of nutrition in a virus infection.

In 1932-33 Edwards investigated the effect of feeding different diets to rats, guinea-pigs and hedgehogs subsequently inoculated intradermally on the foot-pads with foot-and-mouth disease virus, using in all several hundred animals. He gave carefully standardised doses of virus and used the rate and regularity of appearance and the extent of the local and systemic lesions as a measure of

the animals' resistance. The diets consisted principally of natural foodstuffs, and no food consumption records are given, so that it is not possible to evaluate the role of any particular factor in the nutritional situation.

With adult male and female rats weighing 250 to 300 grammes fed a "poor" diet of white wheat bread and milk, upon which their weight gains were reduced or became stationary for five to 30 days before inoculation, the severity of the infection was reduced markedly in the males, less so in the females. In young rats of 45 to 70 grammes weight fed on "good" and "poor" diets for 18 days prior to inoculation, those on the good diets showed much more severe lesions, the females in this experiment showing a greater difference than the males. However, there were marked differences in body weight at the time of inoculation between the groups on the "good" and the "poor" diets, so that the phenomenon of "maturation resistance," which Edwards has also demonstrated in these studies with foot-and-mouth disease virus, may be responsible in part for these results. Young rats raised from weaning to 150 to 200 grammes weight on a "good" diet and then placed on a "poor" diet showed no increased resistance until they had been on the "poor" diet for five months.

Although the results with some individual animals are anomalous, the general trend of these studies established clearly that actively growing animals of good nutriture are less resistant to the virus of foot-and-mouth disease than are animals of comparable age and weight but growing slowly and of poor nutriture. Similar results were obtained in a smaller series of experiments using guinea-pigs and hedgehogs. An interesting observation was that guinea-pigs suffering from diarrhoea caused by changes in the usual diet, and rats with diarrhoea due to *Salmonella typhimurium* infection were both very much more resistant to the virus than comparable unaffected animals.

There are many clinical observations that foot-and-mouth disease is a mild complaint amongst cattle in poor condition on inadequate pasturage, and severe in well-nourished cattle on good grazing, *e.g.*, in India the disease is most prevalent and most severe in the "cool weather" (Edwards, 1937a), in Southern Rhodesia during the rains (Bevan, 1932) and in Eastern Europe during the summer (Hutyra & Marek, 1920).

The results of Edwards' experimental studies provide strong support for the view that an important factor determining variations in the natural course of foot-and-mouth disease is the nutritional status of the infected animals.

Yours faithfully,
HERBERT PARRY.

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HUTYRA, F., & MAREK, J. (1920.) "Special Pathology and Therapeutics of the Diseases of the Domesticated Animals." Trans. by Mohler & Eichhorn. 1. 360. Cited by Edwards (1937a).
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## DISPOSAL OF ANIMAL CARCASES

Sir,—Mr. Kiddle's opinions upon the potential value of knackery material are probably widely shared. Similar beliefs, backed by the findings of one of my colleagues (Phillips, R., 1946, *Nature, Lond.* **157,** 809) prompted us in 1946 to make a successful application to the Agricultural Research Council for a grant to enable others of my colleagues to undertake an extensive study of knackery records, carcases and derived specimens. This investigation forms an integral part of the much wider survey of animal health and production in West Wales and will, we hope, provide data of value to the livestock industry and also lead to parallel studies elsewhere in Great Britain.

My object is not, however, to draw attention to current research, the limitations of which we realise and the extension of which would doubtless be greatly facilitated by control of the kind suggested by Mr. Kiddle. Rather do I wish if possible to help to correct the unfortunate and I trust unintended slight upon knackery owners implicit in Mr. Kiddle's letter. That knackery conditions are far from uniform and, on the average, a long way from perfection, is well realised. But to suggest that the remedy lies in a wholesale replacement of the current system, apparently without due regard for the rights and livelihoods of the present proprietors or their assistants, seems grossly unfair, at least until the opinion of those affected has been determined. The degree of assistance that has been afforded by knackery proprietors and knackermen to my colleagues has been remarkably good, and it accords well with one's impression that the relationships between veterinary practitioners and knackery staffs are, broadly speaking, as cordial as they are extensive.

If the profession through this Association wishes to extend its utilisation of knackery material by some formal plan then the procedure is surely to contact the industry itself and I would venture to suggest that such a move be made. At least, however, let us not fail to make it clear to the knackers that we are appreciative of their past co-operation as well as mindful of the advantages to ourselves that closer liaison might bring.

Yours faithfully,

University College of Wales, ALASTAIR N. WORDEN.
Department of Animal Health,
Agricultural Research Building,
Penglais, Aberystwyth.

*December 20th*, 1948.

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## CONDITIONS OF EMPLOYMENT OF YOUNG GRADUATES

Sir,—I share Mr. Blamire's surprise that the N.V.M.A. should allow an advertisement offering a post at an annual salary of £382 4s. to appear in its official journal. I am even more surprised to note that this advertisement was accepted as in keeping with the recommendations of the Association regarding the employment of graduates.

Although a member of the Association I am unaware of the nature of these recommendations and would appreciate it if they could once again be published in the *Record*—or if information could be given as to the issue of the *Record* in which they first appeared.*

May I, however, state that my disgust at seeing such a salary offered to a qualified man would only be surpassed by knowing that some member of the Royal College of Veterinary Surgeons had such a low opinion of his own capabilities as to accept such a salary.

But no doubt I am unjustly maligning the gentleman who inserted this advertisement—he possibly omitted to state that this was only a part-time post.

Yours faithfully,

Moordown Guest House, R. W. M. GOVER.
Stuart Road,
Highcliffe-on-Sea, Hants.

*December 18th*, 1948.

* Our correspondent appears not to have read his copy of the Supplement issued to members (only) as recently as September 4th last, in which these recommendations are set out in full on page 79, and in which are specified the reasons for the Association's inability to lay down minimum salaries for veterinary assistants.—*Editor.*

## DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

### Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

| Period | Anthrax | Foot-and-mouth | Fowl Pest | Parasitic Mange* | Sheep Scab | Swine Fever |
|---|---|---|---|---|---|---|
| Dec. 1st to 15th, 1948 | 9 | 1 | 5 | — | 4 | — |
| Corresponding period in— | | | | | | |
| 1947 | 4 | — | 109 | — | 10 | — |
| 1946 | 4 | 4 | — | — | 2 | 5 |
| 1945 | 2 | 2 | — | — | 8 | 15 |
| Jan. 1st to Dec. 15, 1948 | 110 | 12 | 259 | 1 | 64 | 27 |
| Corresponding period in— | | | | | | |
| 1947 | 115 | 103 | 2,174 | 1 | 86 | 34 |
| 1946 | 91 | 41 | — | 7 | 92 | 345 |
| 1945 | 115 | 127 | — | 6 | 118 | 906 |

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.